CLAIMS

1. A reverse-layered catalyzed adsorber system, comprising:

a catalyst washcoat supported by a catalyst substrate; and

an adsorption material disposed on at least a portion of the catalyst material layer.

2. The reverse-layered catalyzed adsorber system recited in Claim 1, wherein the catalyst washcoat further comprises a catalyst selected from the group consisting of platinum, palladium, rhodium, iridium, osmium, ruthenium, titanium, zirconium, yttrium, cerium, nickel, copper, and the like, and oxides, mixtures, and alloys comprising at least one of the foregoing metals.

3. The reverse-layered catalyzed adsorber system recited in Claim 2, wherein the catalyst washcoat further comprises a material selected from the group consisting of alumina, silica, titania, magnesia, zirconia, beryllia, lanthana, ceria, barium oxide, barium sulfate, and alloys and mixtures comprising at least one of the foregoing materials.

4. The reverse-layered catalyzed adsorber system recited in Claim 3, wherein the alumina is selected from the group consisting of delta phase alumina, gamma phase alumina, mixtures comprising at least one of the foregoing aluminas.

5. The reverse-layered catalyzed adsorber system recited in Claim 3, wherein the adsorption material further comprises a material selected from the group consisting of zeolites, alumina, silica, titania, and mixtures comprising at least one of the foregoing materials.

6. The reverse-layered catalyzed adsorber system recited in Claim 1, further comprising about 20 wt% to about 80 wt% adsorption material, based upon the total weight of the adsorption material and catalyst washcoat.

7. The reverse-layered catalyzed adsorber system recited in Claim 6, further comprising about 40 wt% to about 60 wt% adsorption material, based upon the total weight of the adsorption material and catalyst washcoat.

8. The reverse-layered catalyzed adsorber system recited in Claim 6, wherein the adsorption material further comprises a material selected from the group consisting of zeolites, alumina, silica, titania, and mixtures comprising at least one of the foregoing materials.

9. A method for manufacturing a reverse-layered catalyzed adsorber system, comprising:

supporting a catalyst washcoat with a catalyst substrate;

covering at least a portion of the catalyst washcoat with an adsorption material such that the catalyst washcoat is disposed between the adsorption material and the catalyst substrate.

10. The method for manufacturing the reverse-layered catalyzed adsorber system recited in Claim 9, wherein the catalyst washcoat further comprises a catalyst selected from the group consisting of platinum, palladium, rhodium, iridium, osmium, ruthenium, titanium, zirconium, yttrium, cerium, nickel, copper, and the like, and oxides, mixtures, and alloys comprising at least one of the foregoing metals.

11. The method for manufacturing the reverse-layered catalyzed adsorber system recited in Claim 10, wherein the catalyst washcoat further comprises a material selected from the group consisting of alumina, silica, titania, magnesia, zirconia, beryllia, lanthana, ceria, barium oxide, barium sulfate, and alloys and mixtures comprising at least one of the foregoing materials.

12. The method for manufacturing the reverse-layered catalyzed adsorber system recited in Claim 9, wherein the adsorption material further comprises a material selected from the group consisting of zeolites, alumina, silica, titania, and mixtures comprising at least one of the foregoing materials.

13. The method for manufacturing the reverse-layered catalyzed adsorber system recited in Claim 9, further comprising about 20 wt% to about 80 wt% adsorption material, based upon the total weight of the adsorption material and catalyst washcoat.

14. The method for manufacturing the reverse-layered catalyzed adsorber system recited in Claim 13, further comprising about 40 wt% to about 60 wt% adsorption material, based upon the total weight of the adsorption material and catalyst washcoat.